

Econometrics I
Fall 1999
Assignment 6

Today's Date: 11/10/99

Due Date: Wednesday, 11/17/99 at beginning of Lab

Please show all of your work and clearly indicate your final response to each question.

1. G11.3
2. G11.10
3. G11.11
4. MGB VII.6
5. MGB VII.16
6. A random sample of 10 draws from the distribution

$$F_X(x) = x^\alpha, \quad x \in [0, 1], \quad \alpha > 0$$

assumes the values: .69,.74,.83,.91,.51,.66,.72,.92,.81,.59.

1. If one exists, form a consistent estimator of α based on the sample mean and find its value for this sample.
2. If one exists, form a consistent estimator of α based on the sample median and find its value for this sample.
3. Find the maximum likelihood estimate of α in this sample. The maximum likelihood estimator is the value of α that maximizes the log likelihood function, or

$$\begin{aligned}\hat{\alpha}_{ML} &= \arg \max_{\alpha} \ln \prod_{i=1}^{10} f_X(x_i) \\ &= \arg \max_{\alpha} \sum_{i=1}^{10} \ln f_X(x_i).\end{aligned}$$

4. Determine which, if any, of the three estimators you have considered are unbiased in small samples (the case here). Which estimator has the best large sample properties? Which would you prefer in this particular case, and why?